

ATTACHMENT C
ORDER NO. R5-2005-
ITEMS TO BE INCLUDED IN A
MONITORING WELL INSTALLATION WORKPLAN AND A
MONITORING WELL INSTALLATION REPORT OF RESULTS
KAWEAH RIVER ROCK COMPANY
SAND AND GRAVEL PLANT
TULARE COUNTY

Prior to installation of groundwater monitoring wells, the Discharger shall submit a workplan containing the minimum listed information. Wells may be installed after staff approve the workplan. Upon installation of the monitoring wells, the Discharger shall submit a report of results, as described below. All workplans and reports must be signed by a registered geologist, certified engineering geologist, or civil engineer registered or certified by the State of California.

SECTION 1 - Monitoring Well Installation Workplan

A. General Information:

- Purpose of well installation project
- Copies of County Well Construction Permits (to be submitted after workplan review)
- Monitoring well locations and rationale
- Survey details
- Equipment decontamination procedures
- Health and safety plan
- Topographic map showing any existing wells, proposed wells, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details:

- Describe drilling technique
- Sampling intervals, and logging methods
- Cuttings storage and disposal

C. Monitoring Well Design:

- Casing diameter and centralizer spacing (if needed)
- Borehole diameter
- Depth of surface seal
- Well construction materials
- Diagram of proposed well construction details
- Type of well cap, bottom cap either screw on or secured with stainless steel screws
- Size of perforations and rationale
- Grain size of sand pack and rationale
- Thickness and position of bentonite seal and sand pack
- Depth of well, length and position of perforated interval

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D. Well Development:

- Require a minimum of 48 hours prior to development activities
- Method of development to be used
- Method of determining when development is complete
- Parameters to be monitored during development
- Method of development water storage and disposal

E. Well Survey:

- Identify the Licensed Land Surveyor or Civil Engineer that will perform the survey
- Describe what well features will be surveyed (i.e. top of casing, horizontal and vertical coordinates, etc.)
- Vertical accuracy shall be to at least 0.01 foot

F. Soil Sampling (if applicable):

- Analyses to be run and methods
- Sample containers, collection method, and preservation method
- Table describing sample volumes, sample containers, preservation agents, and hold times
- Intervals at which soil samples are to be collected
- Number of soil samples to be analyzed and rationale
- Location of soil samples and rationale
- QA/QC procedures

G. Well Sampling:

- Minimum time after development before sampling (48 hours)
- Well purging method and amount of purge water
- Sample containers, collection method, and preservation method
- Table describing sample volumes, sample containers, preservation agents, and hold times
- QA/QC procedures

H. Water Level Measurement:

- The elevation reference point at each monitoring well shall be within 0.01 foot. Ground
- surface elevation at each monitoring well shall be within 0.01 foot. Method and time of water
- level measurement shall be specified.

I. Proposed time schedule for work.

SECTION 2 – Groundwater Sampling and Analysis Plan

A. General Information:

- Purpose of well sampling
- Site Location
- Monitoring well locations
- Monitoring well construction details including elevation, well depth, casing material and size, and screen interval
- Equipment decontamination procedures
- Health and safety plan
- Topographic map showing any existing wells, proposed wells, waste handling facilities, utilities, and other major physical and man-made features.

B. Water Level Measurement:

- Ground surface elevation at each monitoring well shall be within 0.01 foot.
- Method and time of water level measurement shall be specified
- Water level in well shall be allowed to equilibrate prior to measuring the depth to water

C. Well Sampling:

- Well purging method and amount of purge water, purge water storage
- Sample containers, collection method, and preservation method
- Table describing sample volumes, sample containers, preservation agents, and hold times
- Identification of analytical laboratory
- Chain of custody procedures
- QA/QC procedures

D. Proposed time schedule for work.

SECTION 3 - Monitoring Well Installation Report of Results

A. Well Construction:

- Number and depth of wells drilled
- Date(s) wells drilled and completed
- Description of drilling and construction
- Locations relative to facility features such as buildings, storage ponds, waste piles, etc.

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- A well construction diagram for each well must be included in the report, and should contain the following details:
 - Drilling Contractor and driller name
 - Depth of open hole (same as total depth drilled if no caving occurs)
 - Method and materials of grouting excess borehole
 - Footage of hole collapsed
 - Length of slotted casing installed
 - Depth of bottom of casing
 - Depth to top of sand pack
 - Thickness of sand pack
 - Depth to top of bentonite seal
 - Thickness of bentonite seal
 - Thickness of concrete grout
 - Boring diameter
 - Casing diameter
 - Casing material
 - Size of perforations
 - Number of bags of sand
 - Well elevation at top of casing
 - Depth to ground water
 - Date of water level measurement
 - Monitoring well number
 - Date drilled
 - Location

B. Well Development:

- Date(s) of development of each well
- Method of development
- Volume of water purged from well
- How well development completion was determined
- Method of effluent disposal
- Field notes from well development should be included in report.

C. Well Survey:

- Identify the coordinate system or reference points
 - Survey the well casing with the cap removed (horizontal and vertical coordinates)
 - Include the Registered Engineer or Licensed Surveyor's report and field notes in appendix
 - Describe the measuring points (i.e. ground surface, top of casing, etc.)
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- Present the well survey report data in a table

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D. Water Sampling:

- Date(s) of sampling
- How well was purged
- How many well volumes purged
- Levels of temperature, EC, and pH at stabilization
- Sample collection, handling, and preservation methods
- Sample identification
- Analytical methods used
- Laboratory analytical data sheets
- Water level elevation(s)
- Groundwater contour map

E. Soil Sampling (if applicable):

- Date(s) of sampling
- Sample collection, handling, and preservation method
- Sample identification
- Analytical methods used
- Laboratory analytical data sheets